Translation

PATENT COOPERATION TREATY

PCT 10/522590

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference W1.1913PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/DE2003/002467	International filing date (*day/month/year*) 22 July 2003 (22.07.2003)	Priority date (*day/month/year*) 26 July 2002 (26.07.2002)

International Patent Classification (IPC) or national classification and IPC G06K 9/06

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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of _____7_____ sheets, including this cover sheet.

    ☒   This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

    These annexes consist of a total of _____7_____ sheets.

3. This report contains indications relating to the following items:

    I ☒ Basis of the report

    II ☐ Priority

    III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

    IV ☐ Lack of unity of invention

    V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

    VI ☐ Certain documents cited

    VII ☐ Certain defects in the international application

    VIII ☐ Certain observations on the international application

Date of submission of the demand 31 January 2004 (31.01.2004)	Date of completion of this report 15 October 2004 (15.10.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

I. Basis of the report

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

☐ the international application as originally filed.

☒ the description, pages ___3-5, 7-10, 12-14___ , as originally filed,

pages _____ , filed with the demand,

pages ___6, 6a, 11___ , filed with the letter of ___31 January 2004 (31.01.2004)___ ,

pages ___1, 2, 2a___ , filed with the letter of ___10 July 2004 (10.07.2004)___ .

☒ the claims, Nos. _____ , as originally filed,

Nos. _____ , as amended under Article 19,

Nos. _____ , filed with the demand,

Nos. ___1-16___ , filed with the letter of ___10 July 2004 (10.07.2004)___ ,

Nos. _____ , filed with the letter of _____ .

☒ the drawings, sheets/fig ___1/5, 2/5___ , as originally filed,

sheets/fig _____ , filed with the demand,

sheets/fig ___3/5, 4/5, 5/5___ , filed with the letter of ___31 January 2004 (31.01.2004)___ ,

sheets/fig _____ , filed with the letter of _____ .

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. _____ 12-16 _____

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination *(specify):* _____

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. _____
are so unclear that no meaningful opinion could be formed *(specify):*

☒ the claims, or said claims Nos. _____ 12-16 _____ are so inadequately supported
by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. _____ .

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: I I I

The description does not define "circular transformation", but merely mentions certain characteristics (pages 6 and 7: the invariance characteristics are adjustable; ... operate with real coefficient values, is extremely tolerant...). A person skilled in the art would require further explanations in order to implement this concept in accordance with PCT Article 5. A search for this expression in German-language patent databases resulted in no hits (3 June 2004). The only hits in "Google" are articles written by the applicant who is submitting this application. Therefore, this is not a generally known and accepted term. A reference to D3 that is intended to describe the circular transformation was added to the description later. The application (as submitted) is required, however, to be self-explanatory.

Furthermore, there are various methods that could be interpreted as a "circular transformation", for example "Log-polar transform" and "Circular harmonics". Therefore, no opinion can be established with respect to the novelty and inventive step of claims 12-16, because they are not supported by the description (PCT Article 6).

V.	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.   Statement

Novelty (N)	Claims	1-11		YES
	Claims			NO
Inventive step (IS)	Claims			YES
	Claims	1-11		NO
Industrial applicability (IA)	Claims	1-11		YES
	Claims			NO

2.   Citations and explanations

1.   This report makes reference to the following documents:

D1:   US2002/0039446 A1 (4 April 2002)

D2:   US 5602 938 A (20 May 1994)

D3:   Volker Lohweg, Dietmar Müller: "Ein generalisiertes Verfahren zur Berechnung von Transformationsinvarianten Zirkulartransformationen für die Anwendung in der Signal- und Bildverarbeitung", Mustererkennung 2000 22. DAGM Symposium, 13-15 September 2000, pages 213-220.

D1-D3 were not cited in the international search report.

2.   The claims contain several different expressions which do not have their ordinary meaning and to which, instead, the description has given a special, divergent meaning (see PCT Examination Guidelines, part II, 5.20). The examination of novelty and inventive step is based on the meaning as it was understood from the description.

2.1   The meaning of the term "matching function" as supported by the description is a distance measuring tool for a feature (pages 4 and 5). The function is parameterized and results in weighting.

The example on page 10, line 1 supports the assumption that the matching function is a deviation between a measured value (m_x) and a reference value ($x_o(m_x)$).

2.1.1 The conventional meaning of matching makes sense only in the context of recognition features that can be represented in terms of meanings (rather than values).

2.2 According to claim 1, a higher-level matching function is generated by the conjunctive linking of the matching functions of the features. A conjunctive rule (page 5, second and third paragraphs) is clearly involved. The description does not, however, contain specific examples for the rules or the (fuzzy) linking thereof. Therefore, this feature is vague.

Since, according to the description and the subclaims, the higher-level matching function can also be a multimodal potential function, the feature is clearly not restricted to premise evaluation, etc.

2.3 The sympathy value (μ) is calculated from the higher-level matching function in such a way that it can be regarded as being similar to correspondence probability, that is, the distance is transformed into a value close to "1" for a short distance, and into a value decreasing monotonously to "0" for a decreasing distance.

3.   The subject matter of claim 1 as it is understood above does not involve an inventive step within the meaning of PCT Article 33(3) for the following reasons:

3.1   D1 describes a pattern recognition method in which feature values are weighted using matching functions

(paragraph 49, figure 3 or 6) and a higher-level matching function (paragraph 49, "P_{total}") is generated.

The subsequent scaling (paragraph 49) can be regarded as the determination of a sympathy value.

3.2   The method described in D1 differs from the subject matter of claim 1 in that the use is said to relate to a spectral transformation method; paragraphs 19 and 20 mention only feature extraction that is adapted to the recognition task.

3.3   Two-dimensional spectral transformations are, however, a very well known possibility for feature identification in image pattern recognition; see D3, for example. (Since the optional examples are spectral transformations (circular transformations) that are not generally known, claim 1 is not supported by the description; see the remarks in Box III).

The selection of suitable feature extraction and classification methods is one of the general tasks of a person skilled in the art, and therefore any combination of feature extraction and recognition methods that are known *per se* does not involve an inventive step, unless they result in special technical effects.

4.   Dependent claims 2-11 contain no features that, in combination with the features of any claim to which they refer, meet the PCT requirements for inventive step. The reasons therefor are the following:

4.1   With respect to claims 2-4: the subdivision into windows and the separate analysis thereof are obvious measures for checking images for relatively small

deviations.

4.2   Claims 5 and 11 contain only classic concepts of
       "fuzzy logic".

4.4   Claim 6 and 7: a learning phase for determining
       parameters and threshold values is a standard step
       in recognition and examination methods.

4.5   The features of claims 8 and 9 are known from D1
       (figure 3, unimodal function; paragraph 49: P_{ktotal}
       will be multimodal because of the summation).

4.6   Claim 10: The classically weighted Euclidean
       distance is one of the higher-level matching
       functions defined in such a manner, namely for D
       (power) = 2 (see, for example, D2, column 9, lines
       12-64).